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Research Report

THE EVOLVING DEFENSE COMMUNICATIONS SYSTEM

ARMED FORCES COMMUNICATIONS AND ELECTRONICS ASSOCIATION TEAM AWARD

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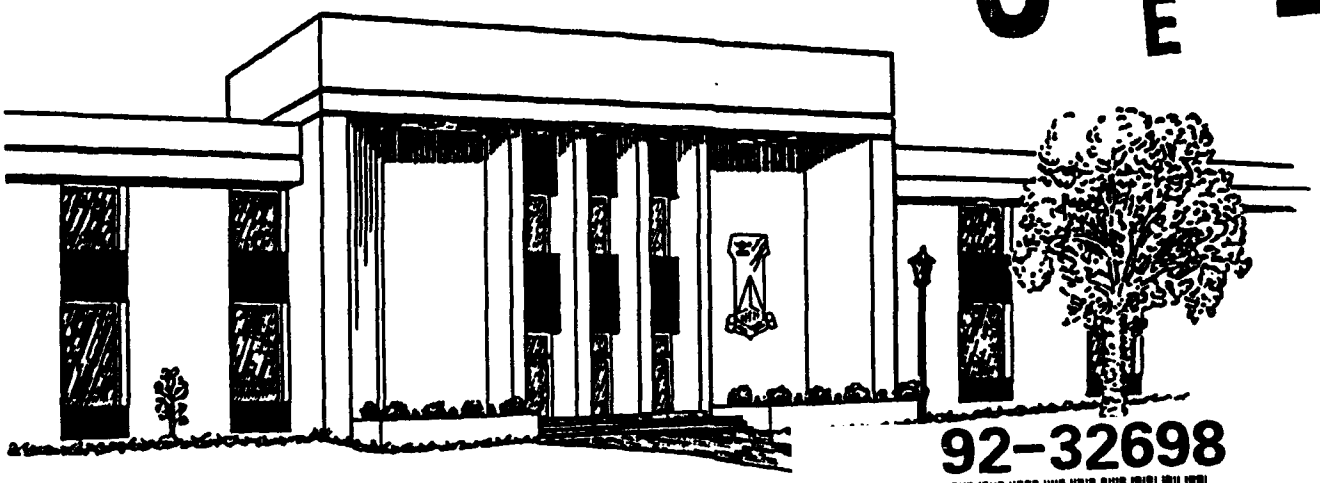

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ABSTRACT

ABSTRACT TITLE: The Evolving Defense Communications System

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Command, control, and communications (C3) systems "help lift the fog of war that adds uncertainty to any military operation." (1:20) They multiply the effectiveness of weapon systems and are critical components of our nation's warfighting capability. One of these critical systems is the Defense Communications System (DCS) which evolved over the past 30 years. Several factors drove this evolution, including constrained budgets, the need to improve the effectiveness and efficiency of the service provided, compatibility and interoperability, and technological advances. Based on lessons learned from Desert Shield/Desert Storm and the changing environment, force structure and strategy, it is time to advance the DCS to its next stage.

The future DCS must be flexible enough to adapt to any situation anywhere in the world. Mobile, modular building block packages of communications equipment must be available to provide effective communications capability to deployed units immediately upon arrival. Total integration and interoperability among military, commercial and other government agencies' communication systems is a must if survivable, robust connectivity is going to be available when needed. Integration planning must begin now.

BIOGRAPHICAL SKETCH

Lieutenant Colonel Ann M. Testa (M.S. Management, University of New York) served in positions dealing with command, control, and communications (C3) at every organizational level since completing Basic Communications Electronics School in 1975. She commanded two communications squadrons and served as the Director of Logistics in a large communications group. She served as a staff officer in Joint Staff positions in Washington, D.C., Colorado Springs and Keflavik, Iceland and on the Air Staff in the Programming and Budget Directorate. Her interest in the DCS began while serving as the Chief, Long-Range Planning and as Special Assistant to the Director of Planning and Systems Integration at Headquarters, Defense Communications Agency. Lt Col Testa was the 1986 Outstanding USAF Communications Electronics Field Grade Manager of the Year and holds the Defense Meritorious Service Medal, Meritorious Service Medal, Joint Service Commendation Medal, Air Force Commendation Medal, and the Air Force Achievement Medal. She is a graduate of Squadron Officer School, Armed Forces Staff College, and the Air War College, Class of 1992.

BIOGRAPHICAL SKETCH

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CHAPTER I

INTRODUCTION

Advanced technology significantly impacts the prosecution of modern warfare. High-technology Command, Control, and Communications (C3) systems and techniques multiply the effectiveness of our weapon systems, our troops, and our decision making on the battlefield. These systems provide the President and his advisers the information required to develop diplomatic and military strategy.

C3 systems "help lift the fog of war that adds uncertainty to any military operation." (1:20) One of the systems which helps lift the "fog of war" and is a critical component of our nation's warfighting capability is the Defense Communications System (DCS). The DCS provides critical information services to DOD users and is a warfighting resource/combat multiplier.

Significant changes are occurring in the international and domestic environment that impact future command and control requirements. Budget cuts, past performance, changing geopolitical and domestic factors, and revisions to the US national security strategy should mold our plans for the future Defense Communications System (DCS).

It is vital that the National Command Authorities (NCA) receive timely and adequate warning and intelligence so they can efficiently and effectively control and direct our military forces during crisis and contingency operations. With proper planning, the future DCS will provide flexible and reliable services and be responsive to our national leaders and warfighters in time of war, as well as peace.

This paper provides background on the establishment of the DCS and its evolution over the past 30 years. It describes the system's use during Desert Shield/Storm, its overall

performance, and what the changing environment means for the future of the DCS. Finally, it provides recommendations on how the reliability, flexibility and robustness of the DCS can be enhanced to meet the demands of the "new world order."

CHAPTER II

BACKGROUND

Prior to 1961, each of the military departments operated their own worldwide long-haul communications systems to support their assigned forces. These communications systems were considered "tactical" although, in fact, many were fixed and provided long-haul, point-to-point service. Each of these systems was composed of a variety of equipment, all designed to meet a specific requirement with little interoperability. (2:3-4) This duplication and incompatibility as well as a number of international crises demonstrating a lack of adequate command and control (C2), was recognized at the DOD level.

In 1957 the Secretary of Defense, Thomas B. Gates, issued a policy statement setting as an objective "an integrated telecommunications system comprised of inherently compatible elements that will economically, efficiently, and effectively satisfy national defense requirements." (3:11) On 12 May, 1960 the Defense Communications Agency (DCA) was established to centralize the management of and provide direction to communications-related activities of the services. (3:13-18) DOD Directive 5101.19 formally established the Defense Communications System (DCS).

Definition and Evolution of the DCS

The DCS is defined in DOD Directive 5101.19 as,

> "a composite of DOD-owned and leased telecommunications subsystems and networks ... It provides the long-haul, point-to-point, and switched network telecommunications needed to interconnect the NCA, the Chairman of the Joint Chiefs of Staff, and the Unified and Specified Commanders with the general purpose networks." (4:2-1)

The DCS provides the transmission media necessary to connect command posts, weather and intelligence networks, dispersed tactical units, supply agencies, large auto-

mated data processing centers, facsimile machines and people. These media include radio, wire, fiber optics, cable and satellite circuits. (2:7)

Initially, the major networks of the DCS were the Automatic Voice Network (AUTOVON); the Automatic Digital Network (AUTODIN) and the Automatic Secure Voice Communications (AUTOSEVOCOM) network. AUTOVON was the first worldwide telecommunications network for telephone and data transmission permitting almost instantaneous contact between decisionmakers and deployed forces worldwide. Shortly thereafter, AUTODIN was established to complement AUTOVON with message capabilities. Finally, AUTOSEVOCOM was established to enable secure voice communications. Using the DCS transmission media, these switched networks carry voice or message signals from one user to another and allow users to share the circuits which connect different locations around the globe. By sharing common circuits, efficiency, flexibility, and economy are obtained.

In 1966, communications capabilities were expanded with the launch of the first Defense Satellite Communications System (DSCS) satellite.

In the 1970's more technological improvements emerged through DSCS, which provided long-haul digital service for secure voice, imagery and other special services. (2:13) Technological breakthroughs with computers provided systems enabling decisionmakers to accurately view fast breaking events. A standardized family of computers to coordinate intelligence and command and control functions worldwide was introduced. As part of an overall plan to meet communications needs and to keep up with state-of-the-art technology, programs were implemented to upgrade the switched networks and to launch new DSCS satellites. A second generation DCS replaced older analog transmission equipment with the new standard digital equipment. (3:12)

In the 1980's, the AUTOVON became the Defense Switched Network (DSN) which is an interbase system for communications from user-to-user. (6:7) The Defense Data Network (DDN) was developed to meet the high-volume data communications requirements of DOD. In addition, the third generation DSCS satellite was launched.

The requirements for communications as an integral part of command and control significantly expanded the wartime mission of the DCS. The DCS has expanded to a multi-billion dollar global network of electronic switches and computers, connected through fiber optic and copper cable, radio, and satellite transmission paths. (7:18) Networking requirements integrated the computer and communications communities and the DCS became more oriented toward interoperability with the US tactical communications systems and with those of our major allies.

As mentioned earlier, the DCS was established to meet the need for a strategic long-haul, fixed, common user communications network. Initially, there was no attempt made to make DCA the responsible agency for interfacing with tactical communications systems nor to specify the parameters for future interface criteria. (8:6) However, the interface and interoperability between the DCS and tactical communications systems became more and more important as strategic communications became the extension of the tactical world.

The statement that General Paschall made in 1978 when he was the Director of DCA became a matter of great importance: "I get involved in tactical systems more and more because it is increasingly difficult to define a line between those and the DCS strategic systems ... what we want is transparency in the interface between the heretofore strategic and tactical systems." (9:17) There is no longer clear demarcation between strategic and tactical communications. Although the DCS was originally implemented as a fixed strategic common user communications system, it became an extension of tactical communications and in some cases replaced tactical systems seen during Desert Shield and Desert Storm.

Tactical C3 problems and the issue of interoperability received little attention before 1983. This neglect became apparent during the invasion of Grenada when effective C2 was not possible because the radios fielded by the various services were not interoperable. After Grenada, the Pentagon established a multi-service tactical organization to improve interoperability. (1:24) This agency was merged into DCA, changing DCA's charter to include the responsibility for ensuring "end-to-end interoperability of strategic and tactical C3 and information systems used by the NCA and the DOD Components for joint and combined operations." (4:2-3)

So, there were several factors that drove the evolution of the DCS. The DCS was established initially for economic and compatibility reasons. The SECDEF was attempting to integrate the costly, "stovepipe" systems and to provide more effective C3 service. The system evolved to the second generation DCS to meet the high-volume data communications requirements, to take advantage of technological breakthroughs and to maintain interoperability with industry (e.g. the common carrier telephone system). In addition, the responsibilities of DCA were expanded to include ensuring interoperability between fielded, tactical C3 systems and the DCS. Based on lessons from Desert Shield and Desert Storm , the changing environment, strategy and force structure, how should the DCS evolve in the future?

CHAPTER III

THE DCS AND DESERT SHIELD/STORM

Operation Desert Shield and Desert Storm highlighted the significance of providing rapidly expandable, sustainable C2 capability to the warfighting CINC. There was an unprecedented demand for worldwide, strategic connectivity and a fully integrated, dynamic network that was capable of supporting the high technology battlefield.

As the magnitude of the operation grew, so did the need for telecommunications support. Desert Shield represented the first true full-scale test of our nationwide civil/military mobilization capability since the Korean War, an undertaking which required substantial telecommunications support. (10:4) One of the most conspicuous deficiencies at the onset of Desert Shield was the lack of a US military communications infrastructure within the theater of operations. Commercial communications facilities were limited in capacity and coverage; and communication networks capable of extending connectivity to the tactical user did not exist. (1:22)

The Central Command (CENTCOM) theater of operations was vastly different from theaters such as Western Europe and Korea. It had no communications presence because Saudi Arabia and other Arab governments had historically resisted any visible, permanent US ground presence. (11:44) CENTCOM was faced with creating a network from the ground up to support combat forces as they deployed into the theater. In addition, vast inter- and intra-theater spatial distances and a rapidly moving ground force over long distances made the establishment and maintenance of C3 capability even more challenging. (1:22)

On 2 August 1990, the CENTCOM communications network consisted of three tactical earth terminals that were supporting the Navy's peacetime needs but were not adequate to support initial C2 requirements. It was not long before the AUTOVON/DSN trunking to the CONUS became saturated and the common user message system (AUTODIN) circuits were backlogged. (12:3)

Satellite connectivity was critical to the operation. Communications could not be established between CENTCOM Forward and the NCA until tactical satellite systems were deployed. This initial communications connectivity was established over the DSCS to a tactical satellite terminal located on the roof of the Saudi Arabian Ministry of Defense. (12:4)

Because of the magnitude of the deployment, a vastly more complex system was needed to satisfy CENTCOM's information requirements. These requirements were satisfied by establishing a Ground Mobile Force satellite terminal network. (12:6) The DSCS functioned as the primary, long-haul communications system providing tactical support to the military forces in theater as well as strategic connectivity to CONUS, Europe and the Pacific. In addition, the infrared Defense Support Program, designed to support strategic operations, was effectively modified and employed to alert and provide warning of the launch of Scuds. (12:7)

By late September, as the troop deployment continued to grow, additional satellite connectivity became necessary. A spare satellite was repositioned and activated in late December and links on another nation's military satellite system were activated. (13:82)

Eventually the CINC's requirements overwhelmed the military's ability to provide all necessary communications and data services using systems readily available in the US military inventory. During this massive buildup, a vital contributor to the comprehensive C3 Desert Storm effort was the commercial telecommunications industry. It provided critical

long-haul services and technical ability. "Traffic flow estimates by the DOD show that commercial leases carried more than 22 percent of the military traffic between the Gulf area and the US" using such systems as commercial transportable satellite terminal units in theater and the commercial INTELSAT satellite network. (13:83)

Deployed units "relied heavily on satellite communications" as soon as they arrived in theater because it was the "only means of communications" until the more conventional, heavier terrestrial systems such as troposcatter and microwave could be airlifted to the region. (14:57) Airlift was based on competing priorities and "the overriding initial priority was to place as much firepower on the ground in the region as soon as possible." (14:57) Communications systems were generally "two weeks behind in deploying to the forces that needed the capability." (14:57) In addition, satellite communications provided the most effective capability. The arriving ground forces insisted on the high data rate throughput capability provided by the DSCS network "because ultra high frequency did not have the throughput that a non-linear and fast moving Air Land Battle doctrine requires." (13:84) Therefore, the DSCS, traditionally a global, strategic system, "had to deploy much further down the echelon of command and into the combat zone than its designers had planned." (13:84)

So, satellite communications became both the quick solution and preferred method. But as more and more units arrived at their operating bases, satellite systems became inundated. In addition, as various equipment from different sources was interfaced to increase communications capacity, problems began to surface.

Problems Experienced

While the C3 support to Desert Shield and Desert Storm on the surface indicated an overwhelming success, there were problems that resurfaced which were identified as far back as 1983 during URGENT FURY in Grenada. These problems ranged from a lack of

satellite capacity to support intelligence requirements to standardization and interoperability issues among services and commands.

The DSCS, which is the backbone of the DCS, provided the bulk of the command and control, early warning, navigation and dissemination of intelligence information, both inter- and intra-theater. However, it entered and ended the Gulf conflict on technically wobbly legs. None of the DSCS satellites that played a key role in Desert Storm were fully operational when the Gulf War ended. (13:81-84) This deficiency was partially a result of the Challenger accident and our lack of a capability to quickly place additional satellites in space during times of crisis. Our combat and peacetime launch capabilities continue to be constrained by existing launch systems which cannot respond to short notice requirements. As a result, the operational C3 capability that CENTCOM and the allied forces required was dependent upon a mix of equipment that came from allied, commercial and US military sources. (13:81) This mix of equipment created interoperability problems which sometimes led to significant delays in the availability of data whose timeliness was important. (12:9-11)

The Army, Air Force and Marines deployed three different generations of tactical communications systems during Operation Desert Shield and Desert Storm. To implement its doctrine of "Air Land Battle", which requires synchronized operation of armored, infantry, artillery, helicopter, and logistics battalions, the Army used its new Mobile Subscriber Equipment (MSE). Ease of operation and rapid installation added flexibility, mobility, and robustness to corps and division C3 and thus enabled commands to exercise command and control over great distances. However, the mixture of MSE and other Tri-Service Tactical Communications (TRI-TAC) equipment required many interfaces, intensive management, and substantial workarounds in both equipment and software not found in peacetime manuals. Likewise, the new Single Channel Ground Airborne Radio System

(SINCGARS) worked extremely well, however, only a few Army and Marine Units were equipped with the radio. (1:24)

Lieutenant General Williams, former Director of the Defense Intelligence Agency (DIA) stated that the problems identified after Grenada virtually continued to exist during the Gulf War. He stated,

> "The intelligence types never really convinced the communicators of the volume of our requirements. The communicators never really told the intelligence types the limitations on their equipment or the frequencies that would constrain their channels. What they are finding in Desert Shield right now is that they just don't have enough comms to support the intelligence." (19:4-6)

This problem was confirmed in a Desert Storm after action report which states, "dissemination, as it turned out, was the Achilles heel of military intelligence. For starters, the normal intelligence communications system (AUTODIN) was overloaded, and it stayed that way throughout the operation. Immediate reports arrived in 12 hours". (20:10)

The highly complex command and control process for conducting the theater air campaign was successful because CINCCENT developed a coherent plan from the beginning of operations and placed authority for ashore air tasking in the hands of the Joint Force Air Component Commander. The amount of detail needed to plan operations for over 1,000 sorties per day was a complex process which resulted in an Air Tasking Order (ATO) the size of a phone book that is time consuming to prepare, disseminate, and digest. Typically it took two hours to transmit a record copy of the ATO. The Air Force Computer Aided Force Management System (CAFMS) employed to produce the daily ATO was not fully interoperable with Navy units. In addition, the lack of a sufficient common transmission media to send and receive the ATO between the Air Force and the Navy was a problem. While the Air Force made CAFMS terminals available to the Navy, the Navy's lack of on-board Super High Frequency communications made transmission of the ATO via CAFMS impossible. The primary means of distribution to the Navy was to ferry the ATO,

on floppy diskette, each night from Riyadh to the command aircraft carriers in the Red Sea and Persian Gulf. From there the ATO was carried by helicopter to other carriers and ships. (21:15-3)

These interoperability problems and lack of crisis response capability must be addressed by a joint team of experts from the services as well as industry. The end result must be C3 systems that are global and robust enough to support any of the regional contingencies that the US could become involved in, in this uncertain world. These systems must be bound by a common operating environment using modular design, fixed, transportable, and tactical communications centers which will connect warfighters regardless of service and location. (30:2-3)

CHAPTER IV

THE CHANGING ENVIRONMENT AND STRATEGY

Experiences in the Desert Shield and Desert Storm operations provide a useful starting point to examine ways of doing business in the future. However, these experiences cannot be examined in isolation. The environment of the 90's creates unique challenges for the DCS.

Significant changes have occurred and will continue to occur in the domestic and international environment. Events such as the dissolution of the Warsaw Pact, the fall of the Communist governments in Europe, the reunification of Germany, and the collapse of the Soviet economy and political system have caused some to believe that the US is no longer threatened. However, there are a wide range of potential threats with a regional focus that could turn into conflicts which require US military engagement. US forces will need capabilities to counter modern threats as a result of advanced weapon proliferation. Providing reliable, real-time intelligence and communications capability becomes even more critical as we move into a multipolar environment filled with many unknowns.

Because of declining defense budgets, the DOD faces difficult choices regarding force structure, readiness, modernization, and forward deployment. Resource constraints are forcing the military to change its strategy to one of a mobilized, positioned, fighting force, to one of a quick-response, rapid-deployment force based primarily in the US. The shift from forward defense to forward presence will decrease in-place intelligence and C3 infrastructure.

This changing posture of the military will increase the demand for, and critically of, information. As the number of US troops stationed around the globe decreases, the

importance of timely, accurate, secure information increases, and, as we experienced in Operation Desert Shield and Desert Storm, the ability to rapidly extend access to this information in austere theaters becomes even more crucial and difficult. Also, the logistics required to prepare and sustain a rapid deployment of troops will require large amounts of information to be processed and transferred over greater distances in less time. (15:9)

Mobile, flexible, and joint power projection capabilities must be our focus as our emphasis shifts from global containment of Communism to global stability. We must give preference to versatile forces that can deter aggression by their ability to respond rapidly and discriminately to a wide range of attacks. Based on this fluid geopolitical environment and our changing strategy that limits our forward presence, it becomes even more imperative that a reliable, high-quality DCS service be available worldwide on demand.

The "new world order" as defined by President Bush calls for us to "build a new international system in the image of our own values and ideas, as old patterns and certainties crumble around us." (16:v) In support of our national security strategy, this requires that we have a C3 infrastructure to respond to regional contingencies, on very short notice, with the military base force packages outlined by the Chairman, Joint Chiefs of Staff in "The National Military Strategy For The 1990s". The four base force packages, a Strategic Force, an Atlantic Force, a Pacific Force and a Contingency Force require four basic supporting capabilities; namely a transportation capability, a space capability, a reconstitution capability and a research and development capability. Space, the second of the supporting capabilities, is extremely critical for communications and C2, for intelligence, surveillance and navigation. (17:20-24) Execution of any of our military options to protect our national security interests with any of the four base force packages depends heavily upon our ability to operate freely in and exploit the high ground of space. (18:17-21)

CHAPTER V

VISION FOR THE FUTURE

The vision for the future DCS is a transition from a collection of loosely connected subsystems, each designed to provide a unique service, to a fully integrated information system providing the full range of required services. There can no longer be a sharp demarcation between strategic and tactical communications. The artificial distinction between tactical and strategic applications that causes fragmented support must end. (22:29)

We need to more effectively integrate commercial, strategic and tactical network planning and implementation to ensure flexible transparent access to information and communications services, particularly in areas where robust connectivity does not exist or is not available to us. Because of the uncertainty of the threat, we must pursue adaptive planning that accommodates interfaces with non-DOD and allied systems. The future DCS must be flexible enough to adapt to major regional contingencies anywhere in the world. Crisis response capabilities such as flexible satellite launch systems and mobile, modular building block packages of communications equipment must be available. These building block packages will provide communications capability to rapidly deploying units immediately upon arrival. Procurement of systems such as the Sacramento Air Logistic Centers' Rapid Airmobile Multi-mission Communications System, which uses commercial off-the-shelf (COTS) equipment, would provide the deployed unit with timely "home-station" like services and the commander with integral communications support until airlift capacity becomes available to bring sustaining systems to augment the deployment packages. (23:1) Under the current concept, many of the deploying units take all required equipment, except communications equipment, from their home bases. (14:57)

Additionally, the demand for strategic connectivity cannot be accommodated without the total integration of and interoperability between commercial and military communications systems. This integration must be planned and exercised well in advance of deployment so that survivable, rapid connectivity is available as the need arises.

Traditional sponsorship and ownership by the services and the CINCs of separate systems that perform similar functions needs to be closely scrutinized and, where possible, discarded in favor of joint and national resources. (24:8) DOD has literally hundreds of separate telecommunications networks, each individually procured, managed and operated. Consolidation of these stove-pipe systems is a must. Consolidation is not only more cost effective but results in a more robust network. During this period of severe budget constraints, teamwork and oneness must be our bywords.

A worldwide network must be developed that serves the military as well in peace as in war. With the services long-haul communications budgets reduced 50 percent in 1993, economies of scale will have to be achieved "by building a DOD network that will handle all traffic-voice, data, video and imagery". (25:2) This network should include strategic/tactical communications interface and interoperability and a "mix of commercial and government-owned systems on a global basis". (25:11)

An option to provide this capability would be to construct three hybrid communications facilities providing deployed forces with a global capability to immediately establish both intra-theater C2 connectivity and direct inter-theater connectivity with CONUS based information sources. These facilities, to be called Global Reach Ground Entry Stations, would be constructed within the footprint overlaps of the DSCS satellite constellation with each station maintaining constant contact with each active DSCS satellite within its field of view in order to provide global coverage.

Locating one of these facilities on each the east and west coast of the United States to exploit the robust, national, commercial communications infrastructure would lessen the overall requirement for DCS resources. A final facility would be located within the East Atlantic/Indian Ocean DSCS footprint overlap and located on a robust portion of the European DCS. All three of these facilities would be interconnected so that deployed forces within the same theater, but serviced through a different satellite, could obtain common intra-theater C2 connectivity. Each facility would be equipped with sufficient rack-mounted TRI-TAC and Ground Mobile Forces (GMF) communications equipment to simultaneously support 16 separate deployed locations. These stations would provide instantaneous access, from all deployed locations, to information sources including AUTODIN, DSN, Red Switched Network, weather communications networks, and the U.S. commercial communications infrastructure. (26:1)

In terms of equipment acquisition, a COTS and nondevelopmental items (NDI) approach should be planned to take advantage of the state-of-the-art hardware that is available from industry. (28:2-1) In addition, leased systems provide a quick means for expanding DCS capacity and connectivity without extensive capital investment. (27:92) We can no longer go to war without our partners in industry. Military preparedness and operations depend heavily upon a strong partnership with commercial vendors and the capabilities that they provide. The use of commercial communications to supplement military communications capabilities should be incorporated into contingency plans and frequently exercised and updated, thereby resolving interface difficulties before the force is called upon to fight.

As DOD consolidates the great number of user unique communications systems, it must work to upgrade its aging network technology. "These networks range in age and technology from the AUTOVON, a Kennedy-era analog voice system still in use in Europe,

and the AUTODIN, a 1970's vintage secure messaging system". (25:3) The lack of reliable, robust C3 systems in future conflicts could mean failure for the US. Therefore, tough decisions will have to be made regarding priorities and allocation of resources to these upgrades. As we transition to the new, smaller base force, we must ensure that it is militarily balanced so that the forces will not be hollow. Weapon system programs will have to be terminated and support systems such as communications and strategic mobility systems will have to be strengthened in order to maintain the proper balance.

Implementation

A continued effort must be made to ensure interoperability is achieved and retained. Interoperability is an elusive and fleeting quality, subject to the perils of equipment modifications, incomplete joint training, changes in battlefield tactics, forces, relationships and procedures, and an evolving political and threat environment. (29:1) Key to ensuring greater interoperability should be the intervention of the Assistant Secretary of Defense for Command, Control, Communications and Intelligence (ASD C3I) in the budgetary and acquisition processes. The ASD C3I, with guidance from the CINCs and the Joint Staff, must exert greater control over both the intelligence and the communications communities to correct the shortfalls and problems that continue to exist. Additionally, the heavy demands of Desert Storm on our communications satellites must translate into increased military and political backing for the Milstar (Military Strategic and Tactical Relay) communications satellite program. This system, designed over a decade ago as the successor to the DSCS satellite constellation, will provide an indestructible and exceptionally capable system of crosslinked satellites that will serve to deter nuclear conflict.

The Secretary of Defense and the Chairman of the Joint Chiefs of Staff must also enforce adherence to the standards through the Military Communications and Electronics Board (MCEB), the Joint Requirements Oversight Council (JROC), and the Defense

Acquisition Board (DAB). C3 systems planned, programmed, and budgeted by the Services must be critically evaluated and validated by the Joint Staff to ensure that these systems are interoperable and fit the OPLANS and CONPLANS of the applicable Combatant Commanders. Finally, the Defense Information Systems Agency (DISA, formerly DCA) should serve as the systems engineering center for C3 standards and exercise oversight for interoperability to meet warfighting requirements. (30:2-4)

Unless action is taken to implement this vision for the DCS in the near-term, the next time that we have to commit the force some place, we will find ourselves with troops that cannot function effectively because of the lack of communications capability.

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